Serial No. 09/965,558
Atty. Doc. No. 01P17802US

1) Please amend the specification to add the following paragraph including a statement of government interest at the very beginning of the specification, as follows.

GOVERNMENT CONTRACT

A1 This invention was made with government support under NIST Cooperative Agreement 70NANB9H3037. The government of the United States of America has certain rights in this invention pursuant to that contract.

2) Please amend the paragraph beginning on page 5, line 16, as follows.

A2 Referring to FIG 1 and 2 there is shown the mold apparatus used for the method of the present invention. The mold apparatus 8 includes a first permeable wall structure 10, a an extracting fibrous material 12, a second permeable wall 14 and a impermeable wall 16. The permeable wall 10 and 14 along with the impermeable wall 14 are closed on the ends to define voids between the walls 10, 14, and 16 or chambers 24, and 30 there between. Openings 18 and 20 are provided as an entry point into the chambers 24 and 30. The function of each of these elements in accordance with the present invention will be discussed in more detail hereafter.

3) Please amend the paragraph beginning on page ~~5~~ 6, line ~~16~~ 26, as follows.

A3. More specifically referring now to FIG. 2, which more clearly illustrates the method of this invention, the spheres 26, are preferable hollow ceramic spheres having walls, which are

shown. Optionally, smaller hollow shapes, such as hollow spheres, as well as the slurry can be used to ~~fillvoid~~ fill void space 28 between the hollow spheres 26. The hollow ceramic spheres 26 are manufactured such that the sphere walls are near 70% to 100% of theoretical density, preferably near 90% to 100% of theoretical density (10% to 0% porous). For good erosion resistance, the wall thickness is preferably between about 100 micrometers to 400 micrometers, depending on sphere diameter. The hollow ceramic spheres 26 are non- sinterable objects which uniquely control the dimensional stability of the material 22 and inhibit volumetric shrinkage during sintering of the resulting insulating material 22. The hollow spheres 26 are also critical in establishing the unique macro- and microstructure of the material 22 and in controlling its unique behavior, both thermally and mechanically. The level of closed macroscopic porosity within the material 22 is defined by the overall size of the hollow ceramic spheres, the wall thickness of the spheres, and their packing arrangement within the structure. The binder material that interstitially bonds or sinters the hollow ceramic spheres together during firing may also contribute a secondary role to these properties depending on the mechanical and thermal properties and the amount of binder materials used. The structure of the resulting material 22 into large geometric shapes such as a cylinder 32, as shown in Figure 3, in accordance with the method of the present invention, imparts unique combinations of properties including, for gas turbine applications, excellent erosion resistance, insulating properties, for components such as combustors and the like and may also be used where abradability is needed which is not achieved by conventional means.

A3 (cont.)

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4) Please amend the paragraph beginning on page ~~5~~ 13, line ~~16~~ 13, as follows.

This method provides good permeation and penetration of the matrix slurry into the void spaces 28 especially for three dimensional geometric shapes such as a cylinder as shown in Figure 3. The extracting member 12 of fibrous material allows capillary wicking of the liquid from the slurry to occur, thus drying the resulting insulating material to a green state. This green state is characterized by the material 22 being semi dried and having structurally integrity such that, depending upon the thickness, the insulating material 22 maybe removed from the mold. If the thickness of the material is small then the material 22 maybe removed from the chamber 30 with the extracting membrane 12 of fibrous material. Optionally prior to the geometric shapes 26 being placed into the chamber 30 a porous film maybe placed against the extracting membrane 12 for easy removal of the ~~insulting~~ insulating material 22 from the extracting membrane material 12. Once removed the insulating material 22 is then dried followed by heating and possibly sintering at a stepped temperature rate and, optionally, binding to a substrate, such a ceramic matrix composite or alloy. The entire mold can be heated up to about 80°C to 120 °C, as an initial heating step to dry the material 22.